



ABSTRACT OF THE DISCLOSURE

A catalyst is provided for addition polymerization of olefinically
5 unsaturated monomers comprising a first compound MY, wherein M is a
transition metal in a low valency state or a transition metal in a low valency
state coordinated to at least one coordinating non-charged ligand, Y is a
monovalent, divalent or polyvalent counterion; an initiator compound
comprising a homolytically breakable bond with a halogen atom; and an
10 organodiimine, where at least one of the nitrogens of the diimine is not part
of an aromatic ring. A catalyst for addition polymerization of olefinically
unsaturated monomers is also provided comprising a first component of

Formula

$[ML]^{n+} A^{n-}$, wherein M = a transition metal of low valency state, L
15 = an organodiimine where at least one of the nitrogens of the diimine is not
part of an aromatic ring, A = an anion, n = an integer of 1 to 3, m = an
integer of 1 or 2;

e) An initiator compound comprising a homolytically breakable bond
with a halogen atom.

Preferably, the organodiimine is a 1,4-diaza-1,3-butadiene, a pyridine carbaldelyde imine, an oxazolidone or a quinoline carbaldehyde.

Processes for using the catalysts are also disclosed.